

**REMARKS**

On entry of this Response, claims 24, 25, 27, 28, and 30 are amended. Claims 1-23 were withdrawn in response to the Restriction Requirement dated March 10, 2008. Amongst remaining claims 24-31, claim 24 is independent. Applicants respectfully submit that claims 24-31 define over the cited art.

**I. Claim Objections**

Claim 25 stands objected to because of minor informalities. See the Office Action, page 2. Applicants amend claim 25 to address the informalities. In light of the amendment, Applicants respectfully request that the Examiner reconsider and withdraw the objection to claim 25.

**II. Claim Rejection under 35 U.S.C. §112**

Claims 24-31 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. See the Office Action, page 3. In the foregoing amendment, Applicants amend claims 24, 27, 28 and 30 to address the indefiniteness of the claims identified by the Examiner. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw the above rejection of claims 24-31.

**III. Claim Rejection under 35 U.S.C. §102****A. US 5,798,540**

Claims 24 and 25 stand rejected under 35 U.S.C. §102(b) as being anticipated by US 5,798,540 (hereinafter “Boos”). See the Office Action, page 5. Applicants respectfully traverse the rejection in view of the amended claims.

Applicants respectfully submit that Boos does not disclose *a semiconductor structure comprising  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  material with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$* , as recited in amended claim 24.

Boos discloses an electronic device characterized by a GaAs substrate and a base disposed on the substrate. In Boos, the base includes InAs channel layer, AlSb layer,  $In_x Al_{1-x}$   $As_y Sb_{1-y}$  layer, InAs cap layer,  $p^+$  GaSb layer, Schottky gate, at least one ohmic contact, and a trench. See Boos, abstract.

Boos, however, does not disclose that the base includes  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  material with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$ , as recited in amended claim 24. There is no disclosure in Boos of  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$ .

For the reasons set forth above, Applicants respectfully submit that Boos does not disclose each and every element of amended claim 24. Claim 25 depends from claim 24 and, as such, incorporates all of the features recited in claim 24. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw the above rejection of claims 24 and 25.

## **B. US 5,577,061**

Claims 24-31 stand rejected under 35 U.S.C. §102(b) as being anticipated by US 5,577,061 (hereinafter “Hasenburg”). See the Office Action, page 6. Applicants respectfully traverse the rejection in view of the amended claims.

Applicants respectfully submit that Hasenborg does not disclose *a semiconductor structure comprising  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  material with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$* , as recited in amended claim 24.

Hasenborg discloses a mid-IR laser having AlAs/Al<sub>x</sub>Ga<sub>1-x</sub>Sb or InAs/Al<sub>x</sub>Ga<sub>1-x</sub>Sb. In Hasenborg, the layers of the n-type cladding region are doped n-type, utilizing silicon, and may be used with active region materials, such as InAs<sub>z</sub>Sb<sub>1-z</sub> and In<sub>w</sub>Ga<sub>1-w</sub>As<sub>y</sub> Sb<sub>1-y</sub>. See Hasenborg, abstract.

Hasenborg, however, does not disclose that the laser includes Al<sub>1-x-z</sub>Ga<sub>x</sub>In<sub>z</sub>As<sub>1-y</sub>Sb<sub>y</sub> material with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$ , as recited in amended claim 24. There is no disclosure in Hasenborg of Al<sub>1-x-z</sub>Ga<sub>x</sub>In<sub>z</sub>As<sub>1-y</sub>Sb<sub>y</sub> with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$ .

For the reasons set forth above, Applicants respectfully submit that Hasenborg does not disclose each and every element of amended claim 24. Claims 25-31 depend from claim 24 and, as such, incorporate all of the features recited in claim 24. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw the above rejection of claims 24-31.

### **C. Hasenborg or Deryagin et al.**

Claims 24-31 stand rejected under 35 U.S.C. §102(b) as being anticipated by Hasenborg or Deryagin et al., ‘High Quality AlGaSb, AlGaAsAb and InGaAsSb epitaxial layers grown by liquid-phase epitaxy from Sb-rich melts’ (hereinafter ‘Deryagin’). See the Office Action, page 7. Applicants respectfully traverse the rejection in view of the amended claims.

As discussed above, Hasenborg does not disclose *a semiconductor structure comprising  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  material with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$* , as recited in amended claim 24.

Applicants also respectfully submit that Deryagin does not disclose *a semiconductor structure comprising  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  material with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$* , as recited in amended claim 24.

Deryagin discloses the growth of AlGaSb, AlGaAsSb and InGaAsSb epilayers. In Deryagin, the obtained composition ranges are  $0.02 \leq x \leq 0.20$  for  $Al_xGa_{1-x}Sb$ ,  $Al_xGa_{1-x}As_ySb_{1-y}$  epilayers and  $0.04 \leq x \leq 0.24$  for  $In_xGa_{1-x}As_ySb_{1-y}$  layers. See Deryagin, abstract.

Deryagin, however, does not disclose the layer of  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  material with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$ , as recited in amended claim 24. There is no disclosure in Deryagin of  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$ .

For the reasons set forth above, Applicants respectfully submit that Hasenburg or Deryagin does not disclose each and every element of amended claim 24. Claims 25-31 depend from claim 24 and, as such, incorporate all of the features recited in claim 24. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw the above rejection of claims 24-31.

#### **IV. Claim Rejection under 35 U.S.C. §103**

Claims 24-31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Boos in view of Deryagin. See the Office Action, page 6. Applicants respectfully traverse the rejection in view of the amended claims.

Applicants respectfully submit that the combination of Boos and Deryagin does not teach or suggest *a semiconductor structure comprising  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  material with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$* , as recited in amended claim 24.

As discussed above, none of Boos and Deryagin disclose  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  material with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$ , as recited in amended claim 24. Although Boos and

Deryagin are combined as suggested by the Examiner, the combination does not teach or suggest a semiconductor structure that includes  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  material with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$ . There is no disclosure in Boos and Deryagin of  $Al_{1-x-z}Ga_xIn_zAs_{1-y}Sb_y$  with  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$  and  $0 < x+z < 1$ .

For the reasons set forth above, Applicants respectfully submit that the combination of Boos and Deryagin does not teach or suggest all of the limitations of amended claim 24. Claims 25-31 depend from claim 24 and, as such, incorporate all of the features recited in claim 24. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw the above rejection of claims 24-31.

#### **V. Conclusion**

In view of the above amendment, Applicants believes the pending application is in condition for allowance.

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Respectfully submitted,

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